

## HEAD OF LARVAL MUSCA—PRELIMINARY NOTE.

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The *muscidae* are usually said to have headless larvae. The real state of matters however is that their head is buried in their thorax, to be thrust out at will during larva-hood, or permanently in the adult. Some years ago I spent fruitless time in attempting to investigate this structure; but recent researches on the head and proboscis of the adult have enabled me to return to the attack with greater success. Mr. Walter M. Rankin has cut for me some excellent transverse sections of the head of the larva of *Musca caesar*, and by their help as well as by teasing I have got the following results.

1. The head has a double skeleton, the one independent of the other: (1) a large dark-colored case, figured by Weismann,<sup>1</sup> consisting of proximal, mid-, and distant parts, the distant part being the well-known "hooks" (really a bifurcated piece); (2) a chitinous armature lining the pharynx: outside of the pharynx-wall (therefore organically in the head) are muscles which join it to the larger, dark-colored case.

2. The dark-colored part represents the fulcrum, mid-segment, and the forked distal supports of the proboscis of the adult. The relation of parts is the same as in the adult: the salivary duct, made by the union of the ducts of the paired salivary glands, enters the mouth at the mid-proboscis as in the adult.

and the longitudinal and transverse muscles are much as they shall always be.

3. The "hooks", or forked distal part, appear to be the precursors of the upper fork of the adult disti-proboscis: they have also inferior processes representing the inferior fork of the same. Perhaps these hooks are the mandibles.

4. The armature of the pharynx consists of a chitinous sheath lining its lumen. On the floor of this are eight longitudinal bars, which are found on cross-section to be hollow, each with a longitudinal slit opening towards the lumen of the pharynx.

5. On tracing the pharynx-armature to its anterior extremity we find that it terminates abruptly by a rim which supports a number of teeth at the roots of the longitudinal bars referred to. Here we have evidence that the longitudinal bars of the larva represent the pseudotracheae of the adult: they open by a long slit, and have transverse semi-rings so as to produce a resemblance to tracheae, all as in the pseudotracheae.

6. Hence the slit tubes which line the pharynx of the larva are identical with the pseudotracheae of the adult: and the swollen "labella" of the disti-proboscis of the adult are the everted stomodaeum, whilst its supporting forks are probably the mandibles.

7. The muscular apparatus for opening the pharynx is as in the adult. Long muscles descend from the walls of the

<sup>1</sup> Zeitschr. f. wiss. zool., 1863-1866.

fulcrum to the roof of the pharynx, so as by their contraction to raise the roof, to enlarge the cavity, and to turn it into a forcing pump. When the pharynx is not so distended its roof is arched upwards and its lumen on cross-section merely a transverse slit. Above it—within the hollow of the arch—is a system of radiating muscles which increase the curvature of the pharynx-roof and so close it unless when antagonised by the descending muscles.

8. Except by the muscles, and at its

inferior margin, the fulcrum has no organic connection with the pharynx. As the fulcrum transverses the length of the head, free externally of the outer wall of the head, and free internally of the proboscis which pierces it though separated from it, and as it is enclosed by muscles on both sides, it must be endoskeletal in its nature, *i. e.*, an ingrowth from the exoskeleton, like the endophragms of the thorax or the endocranium of the head of other insects.

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## NOTES ON SOME COLEOPTERA TAKEN IN SOUTH LOUISIANA.

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The whole of Louisiana has been included by Leconte in the southern province of his great Atlantic district.<sup>1</sup> It would seem however, upon further consideration of the fauna, that the southern strip parallel with the coast should be connected with his "subtropical province, including the seacoast of Texas" (see map by Leconte); which, moreover, as he says, "belongs more properly to the eastern province of the tropical zoological district of Mexico."<sup>2</sup> It was in what might be called the subtropical province of the seacoast of Louisiana (being a continuation of the coast strip embraced in the eastern province of Mexico) that these notes were

collected, and the observations here given made.

It will be borne in mind that at the time of my visit, 29 March to 21 June 1884, a large tract of country near Bayou la Fourche was overflowed from the great crevasse of March the same year. For the identification of most of the species to which these notes refer, I am indebted to the kindness of Dr. G. H. Horn.

The *cicindelidae* seemed to be nearly absent or of local occurrence in southern Louisiana, and not to frequent the low lands of that part of the state. I saw only two specimens of this family (one larva of *Tetracha carolina*, and one *Cicindela repanda*) in the latitude of New Orleans. Afterwards I saw *C. tortuosa* with *C. repanda* at the mouth of Red River. Though I visit-

<sup>1</sup> LECONTE, J. L. The coleoptera of Kansas and eastern New Mexico; with map showing the entomological provinces of North America. Wash., *Smithsonian Institution*, 1859, p. iv.

<sup>2</sup> *Loc. cit.*, p. iii-iv.